

We claim:

1. An isolated polynucleotide comprising a polynucleotide chosen from:
- a) a polynucleotide encoding a polypeptide having at least 95% identity to SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
 - b) a polynucleotide encoding a polypeptide having at least 98% identity to SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
 - c) a polynucleotide encoding a polypeptide having at least 99% identity to SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
 - d) a polynucleotide encoding a polypeptide comprising SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
 - e) a polynucleotide encoding a polypeptide capable of raising antibodies having binding specificity for a polypeptide comprising SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
 - f) a polynucleotide encoding an epitope bearing portion of a polypeptide comprising SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
 - g) a polynucleotide comprising SEQ ID No : 1, 3, 5, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43 or fragments or analogs thereof;
 - h) a polynucleotide that is complementary to a polynucleotide in (a), (b), (c), (d), (e), (f) or (g).

2. An isolated polynucleotide comprising a polynucleotide chosen from:
- a) a polynucleotide encoding a polypeptide having at least 95% identity to SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;
 - b) a polynucleotide encoding a polypeptide having at least 98% identity to SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;
 - c) a polynucleotide encoding a polypeptide having at least 99% identity to SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;
 - d) a polynucleotide encoding a polypeptide comprising SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;
 - e) a polynucleotide encoding a polypeptide capable of raising antibodies having binding specificity for a polypeptide comprising SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;
 - f) a polynucleotide encoding an epitope bearing portion of a polypeptide comprising SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;
 - g) a polynucleotide comprising SEQ ID No : 1, 3, 5, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41 or 43;
 - h) a polynucleotide that is complementary to a polynucleotide in (a), (b), (c), (d), (e), (f) or (g).
3. An isolated polynucleotide consisting essentially of a polynucleotide chosen from:
- a) a polynucleotide encoding a polypeptide having at least 95% identity to SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
 - b) a polynucleotide encoding a polypeptide having at least 98% identity to SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30,

32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;

- c) a polynucleotide encoding a polypeptide having at least 99% identity to SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
- d) a polynucleotide encoding a polypeptide having SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
- e) a polynucleotide encoding a polypeptide capable of raising antibodies having binding specificity for a polypeptide having SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
- f) a polynucleotide encoding an epitope bearing portion of a polypeptide having SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
- g) a polynucleotide having SEQ ID No : 1, 3, 5, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43 or fragments or analogs thereof;
- h) a polynucleotide that is complementary to a polynucleotide in (a), (b), (c), (d), (e), (f) or (g) wherein said polynucleotide encodes a polypeptide that is immunogenic.

4. An isolated polynucleotide consisting essentially of a polynucleotide chosen from:

- a) a polynucleotide encoding a polypeptide having at least 95% identity to SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;
- b) a polynucleotide encoding a polypeptide having at least 98% identity to SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;

- c) a polynucleotide encoding a polypeptide having at least 99% identity to SEQ ID No :
 - d) a polynucleotide encoding a polypeptide having SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;
 - e) a polynucleotide encoding a polypeptide capable of raising antibodies having binding specificity for a polypeptide having SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;
 - f) a polynucleotide encoding an epitope bearing portion of a polypeptide having SEQ ID No : 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;
 - g) a polynucleotide having SEQ ID No : 1, 3, 5, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41 or 43 ;
 - h) a polynucleotide that is complementary to a polynucleotide in (a), (b), (c), (d), (e), (f) or (g) wherein said polynucleotide encodes a polypeptide that is immunogenic.
5. An isolated polynucleotide comprising a sequence that hybridizes under stringent conditions to either
- a) a DNA sequence encoding a polypeptide or
 - b) the complement of a DNA sequence encoding a polypeptide; wherein said polypeptide comprises SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof.
6. The polynucleotide of claim 1 that hybridizes under stringent conditions to either
- a) a DNA sequence encoding a polypeptide or
 - b) the complement of a DNA sequence encoding a polypeptide, wherein said polypeptide comprises SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof.

7. The polynucleotide of claim 2 that hybridizes under stringent conditions to either
 - a) a DNA sequence encoding a polypeptide or
 - b) the complement of a DNA sequence encoding a polypeptide, wherein said polypeptide comprises SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44.
8. The polynucleotide of claim 3 that hybridizes under stringent conditions to either
 - a) a DNA sequence encoding a polypeptide or
 - b) the complement of a DNA sequence encoding a polypeptide; wherein said polypeptide has SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof.
9. The polynucleotide of claim 4 that hybridizes under stringent conditions to either
 - a) a DNA sequence encoding a polypeptide or
 - b) the complement of a DNA sequence encoding a polypeptide; wherein said polypeptide has SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44.
10. The polynucleotide of claim 1 that hybridizes under stringent conditions to either
 - a) a DNA sequence encoding a polypeptide or
 - b) the complement of a DNA sequence encoding a polypeptide; wherein said polypeptide comprises at least 10 contiguous amino acid residues from a polypeptide comprising SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof.
11. The polynucleotide of claim 2 that hybridizes under stringent conditions to either

- a) a DNA sequence encoding a polypeptide or
 - b) the complement of a DNA sequence encoding a polypeptide;
wherein said polypeptide comprises at least 10 contiguous amino acid residues from a polypeptide SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44.
12. The polynucleotide of claim 3 that hybridizes under stringent conditions to either
- a) a DNA sequence encoding a polypeptide or
 - b) the complement of a DNA sequence encoding a polypeptide;
wherein said polypeptide has at least 10 contiguous amino acid residues from a polypeptide comprising SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof.
13. The polynucleotide of claim 4 that hybridizes under stringent conditions to either
- a) a DNA sequence encoding a polypeptide or
 - b) the complement of a DNA sequence encoding a polypeptide;
wherein said polypeptide has at least 10 contiguous amino acid residues from a polypeptide SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44.
14. A vector comprising the polynucleotide of anyone of claims 1 to 13 , wherein said DNA is operably linked to an expression control region.
15. A host cell transfected with the vector of claim 14.
16. A process for producing a polypeptide comprising culturing a host cell according to claim 15 under conditions suitable for expression of said polypeptide.

17. An isolated polypeptide comprising a polypeptide chosen from:
- a) a polypeptide having at least 95% identity to an amino acid sequence comprising SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
 - b) a polypeptide having at least 98% identity to an amino acid sequence comprising SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
 - c) a polypeptide having at least 99% identity to an amino acid sequence comprising SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
 - d) a polypeptide comprising SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
 - e) a polypeptide capable of raising antibodies having binding specificity for a polypeptide comprising SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
 - f) an epitope bearing portion of a polypeptide comprising SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
 - g) the polypeptide of (a), (b), (c), (d), (e) or (f) wherein the N-terminal Met residue is deleted;
 - h) the polypeptide of (a), (b), (c), (d), (e), or (f) wherein the secretory amino acid sequence is deleted.
18. An isolated polypeptide comprising a polypeptide chosen from:
- a) a polypeptide having at least 95% identity to an amino acid sequence comprising SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;

- b) a polypeptide having at least 98% identity to an amino acid sequence comprising SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;
- c) a polypeptide having at least 99% identity to an amino acid sequence comprising SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;
- d) a polypeptide comprising SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;
- e) a polypeptide capable of raising antibodies having binding specificity for a polypeptide comprising SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;
- f) an epitope bearing portion of a polypeptide comprising SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;
- g) the polypeptide of (a), (b), (c), (d), (e) or (f) wherein the N-terminal Met residue is deleted;
- h) the polypeptide of (a), (b), (c), (d), (e), or (f) wherein the secretory amino acid sequence is deleted.

19. An isolated polypeptide consisting essentially of a polypeptide chosen from:

- a) a polypeptide having at least 95% identity to an amino acid sequence having SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
- b) a polypeptide having at least 98% identity to an amino acid sequence having SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
- c) a polypeptide having at least 99% identity to an amino acid sequence having SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;

- d) a polypeptide having SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
 - e) a polypeptide capable of raising antibodies having binding specificity for a polypeptide having SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
 - f) an epitope bearing portion of a polypeptide having SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof;
 - g) the polypeptide of (a), (b), (c), (d), (e) or (f) wherein the N-terminal Met residue is deleted;
 - h) the polypeptide of (a), (b), (c), (d), (e), or (f) wherein the secretory amino acid sequence is deleted
- wherein said polypeptide is immunogenic.

20. An isolated polypeptide consisting essentially of a polypeptide chosen from:

- a) a polypeptide having at least 95% identity to an amino acid sequence having SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;
- b) a polypeptide having SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;
- c) a polypeptide capable of raising antibodies having binding specificity for a polypeptide having SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;
- d) an epitope bearing portion of a polypeptide having SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44;
- e) the polypeptide of (a), (b), (c), (d), (e) or (f) wherein the N-terminal Met residue is deleted;
- f) the polypeptide of (a), (b), (c), (d), (e), or (f) wherein the secretory amino acid sequence is deleted

wherein said polypeptide is immunogenic.

21. A chimeric polypeptide comprising two or more polypeptides comprising SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44 or fragments or analogs thereof; provided that the polypeptides are linked as to form a chimeric polypeptide.
22. A chimeric polypeptide comprising two or more polypeptides comprising SEQ ID NO: 2, 4, 6, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42 or 44 provided that the polypeptides are linked as to form a chimeric polypeptide.
23. A pharmaceutical composition comprising a polypeptide according to any one of claims 17 to 20 and a pharmaceutically acceptable carrier, diluent or adjuvant.
24. A pharmaceutical composition comprising a polypeptide according to any one of claims 21 to 22 and a pharmaceutically acceptable carrier, diluent or adjuvant.
25. A method for prophylactic or therapeutic treatment of S. pyogenes infection in a host susceptible to S. pyogenes infection comprising administering to said host a prophylactic or therapeutic amount of a composition according to claim 23.
26. A method according to claim 23 wherein the host is a neonate, an infant or a child.
27. A method according to claim 23 wherein the host is an immunocompromised host.
28. A method according to claim 23 wherein the host is an adult.

29. A method according to claim 23 wherein the host is an elderly.
30. A method for prophylactic or therapeutic treatment of S. pyogenes infection in a host susceptible to S. pyogenes infection comprising administering to said host a prophylactic or therapeutic amount of a composition according to claim 24.
31. A method for prophylactic or therapeutic treatment of infections, including pharyngitis, erysipelas, impetigo, scarlet fever, and invasive diseases such as bacteremia and necrotizing fasciitis comprising administering to said host a therapeutic or prophylactic amount of a composition according to claim 23.
32. A method for diagnosis of S. pyogenes infection in an host susceptible to S. pyogenes infection comprising
- a) obtaining a biological sample from a host;
 - b) incubating an antibody or fragment thereof reactive with a polypeptide according to any one of claims 17 to 20 with the biological sample to form a mixture; and
 - c) detecting specifically bound antibody or bound fragment in the mixture which indicates the presence of S. pyogenes.
33. A method for the detection of antibody specific to a S. pyogenes antigen in a biological sample containing or suspected of containing said antibody comprising
- a) obtaining a biological sample from a host;
 - b) incubating one or more polypeptides according to any one of claims 17 to 20 or fragments thereof with the biological sample to form a mixture; and

c) detecting specifically bound antigen or bound fragment in the mixture which indicates the presence of antibody specific to *S. pyogenes*.

34. Use of the pharmaceutical composition according to claim 23 in the manufacture of a medicament for the prophylactic or therapeutic treatment of *S. pyogenes* infection.

35. Use of the pharmaceutical composition according to claim 24 in the manufacture of a medicament for the prophylactic or therapeutic treatment of *S. pyogenes* infection.

36. Kit comprising a polypeptide according to any one of claims 17 to 20 for detection or diagnosis of *S. pyogenes* infection.

37. Kit comprising a polypeptide according to any one of claims 21 to 22 for detection or diagnosis of *S. pyogenes* infection.